



**TECHNICAL  
SAFETY BC**

Safe technical systems. Everywhere.

# GAS UTILITY EXAM SYLLABUS

Gas Utility Certificate of Qualification

Gas Safety Management  
August 2015

SLY-GA 106



## Syllabus for a Gas Utility Certificate Examination

### 1. PREREQUISITES TO OBTAIN A GAS UTILITY CERTIFICATE OF QUALIFICATION

An applicant for a gas utility certificate of qualification must:

- have successfully completed 2 years of training in utility installations satisfactory to a provincial safety manager;
- successfully pass the Gas Utility certification exam

### 2. SCOPE OF THE GAS UTILITY CERTIFICATE OF QUALIFICATION

A gas utility certificate of qualification entitles the holder, while employed by a gas utility and after gas service is interrupted, to do any of the following:

- relight gas equipment with an input of 120 kW or less;
- replace thermocouples;
- make other minor repairs;
- do safety checks.

### 3. SUBJECT AREAS OF STUDY

		Percentage (%) on Exam
<b>3.1</b>	<b>Safety Standards Act and applicable regulation</b>	<b>6%</b>
	3.1.1 Certificates of qualification	
	3.1.2 Individual responsibilities	
	3.1.3 Requirements for permits	
	3.1.4 Technical requirements (Codes, Regulation Variations)	
<b>3.2</b>	<b>Gas Properties</b>	<b>12%</b>
	3.2.1 Sources, Contents (Natural & Propane)	
	3.2.2 Specific Gravity	
	3.2.3 Flammable Limits	
	3.2.4 Ignition Temperature	
	3.2.5 Flame Speed	
	3.2.6 Toxicity	
	3.2.7 State (liquid & gaseous)	





<b>3.3</b>	<b>Combustion</b>	<b>12%</b>
	3.3.1 Perfect Combustion	
	3.3.2 Products of Combustion & Volumes	
	3.3.3 Air Required	
	3.3.4 CO	
	3.3.5 Air (Combustion, excess & dilution)	
	3.3.6 Flue Gas Analysis	
<b>3.4</b>	<b>Regulators</b>	<b>6%</b>
	3.4.1 Principle of Operation	
	3.4.2 Types-Service, System, Appliance	
	3.4.3 Relief & Vents	
	3.4.4 Sizing	
	3.4.5 Trouble shooting	
<b>3.5</b>	<b>Appliances</b>	<b>11%</b>
	3.5.1 B.C. Gas Code (B149.1; section 7)	
	3.5.2 Furnaces	
	3.5.3 Boilers (Pool Heaters) & HW Heating	
	3.5.4 Water Heating, Storage & Instantaneous	
	3.5.5 Conversion from other Fuels	
	3.5.6 Diagnosing faults	
<b>3.6</b>	<b>Combustion Air</b>	<b>5%</b>
	3.6.1 Principles	
	3.6.2 Requirements	
	3.6.3 Sizing	
<b>3.7</b>	<b>Venting</b>	<b>4%</b>
	3.7.1 Purposes	
	3.7.2 Principles	
	3.7.3 House as a System	
	3.7.4 Draft Control	
	3.7.5 Materials	
	3.7.6 Direct Vent	
	3.7.7 Installation	
	3.7.8 Fan, Forced & Induced	
	3.7.9 Size requirements	
	3.7.10 Identify hazards	
<b>3.8</b>	<b>Orifice Sizing</b>	<b>6%</b>
	3.8.1 Principles	





- 3.8.2 Lifting, Flashback & Problems
- 3.8.3 Orifice Types
- 3.8.4 Pressure & Orifice
- 3.8.5 Orifice Tables & Sizing
- 3.8.6 Input & Output
- 3.8.7 Converting (Natural to/from Propane)
- 3.8.8 High Altitude

## 3.9 Pilot and Burner Operation

12%

- 3.9.1 Electric Valves
- 3.9.2 Non-electric Valves
- 3.9.3 Combination Valves
- 3.9.4 Water Heater Valves
- 3.9.5 Gas Range Valves
- 3.9.6 Flame Safeguard Systems & Purpose
- 3.9.7 Thermocouples
- 3.9.8 Pilot Generators
- 3.9.9 Flame Rods
- 3.9.10 Spark Control Modules
- 3.9.11 Basic system controls & operational characteristics
- 3.9.12 Trouble shooting

## 3.10 Meter Clocking

6%

- 3.10.1 Gas Meter Operation
- 3.10.2 Metric Meters
- 3.10.3 Clocking Formula
- 3.10.4 Clocking Low Pressure
- 3.10.5 Pressure Correction
- 3.10.6 Clocking High Pressure

## 3.11 Electrical

6%

- 3.11.1 Electrical Theory
- 3.11.2 AC & DC
- 3.11.3 Magnetism
- 3.11.4 Circuits, Series & Parallel
- 3.11.5 Symbols
- 3.11.6 Diagrams, Schematic & Ladder
- 3.11.7 Millivolt
- 3.11.8 Meters & Trouble Shooting
- 3.11.9 Polarity & Phasing
- 3.11.10 Single Thermocouples
- 3.11.11 Pilot Generators
- 3.11.12 Millivolt Trouble Shooting



**3.12 Pipe Systems****8%**

- 3.12.1 Related code
- 3.12.2 Materials (Natural & Propane)
- 3.12.3 Joining Pipe
- 3.12.4 Flow & Pressure Drop
- 3.12.5 Testing
- 3.12.6 Cathodic Protection
- 3.12.7 Introduction to tables
- 3.12.8 Sizing requirements

**3.13 Propane Systems****6%**

- 3.13.1 B149.2 Code used
- 3.13.2 Tank location requirements
- 3.13.3 Regulator type and system design
- 3.13.4 Vaporizer type & operation
- 3.13.5 Identification of system hazards

